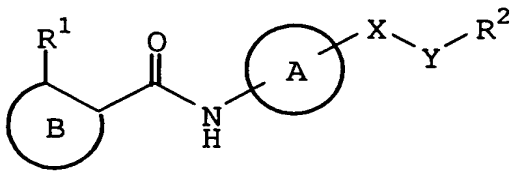
CLAIMS

1. A compound of the formula (I)



(I)

wherein

R^1 is hydrogen, lower alkyl, lower alkenyl, halo(lower)alkyl, cyclo(lower)alkyl, lower alkoxy, lower alkylthio, acyl, optionally substituted aryl or NR^3R^4, wherein

R^3 and R^4 are each independently hydrogen, lower alkyl, cyclo(lower)alkyl or acyl; or

R^3, R^4 and nitrogen atom to which they are attached form an optionally substituted, saturated or partially saturated N-containing heterocyclic group optionally having one or more oxygen or sulfur atom(s) and optionally having one or two lower alkyl(s);

R^2 is hydrogen; or aryl or heteroaryl in which imino group is optionally protected by amino protective group, each of which is optionally substituted by cyano, optionally protected amino, lower alkyl or heteroaryl substituted by one or more lower alkyl(s);

X is direct bond or bivalent residue derived from piperazine;

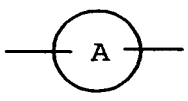
Y is $-(A^1)_n-(A^2)_m-$

wherein

A^1 is -O-, -NH-, $-N(R^5)-$, -CO-, -CH(OH)-, -NH-CO-, -CO-NH-, $-CH_2-NH-CO-$, $-CH_2-CO-NH-$ or $-(CH_2)_2-NH-CO-$, wherein R^5 is amino protective group,

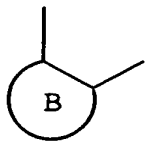
A^2 is lower alkylene optionally substituted with lower alkyl or heteroaryl, and

n and m are independently 0 or 1;

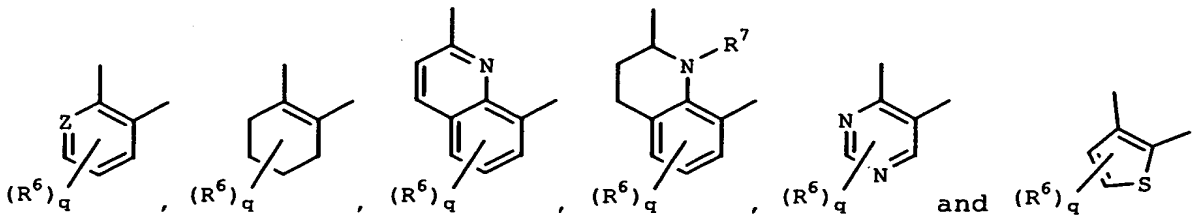


is bivalent residue derived from arene or

heteroarene; and



is bivalent residue derived from arene or heteroarene selected from



wherein

Z is N or C(R^{10}),

R^6 is hydrogen, halogen, lower alkyl, lower alkoxy, halo(lower)alkyl, lower alkanoyl, lower alkylthio or -NR^8R^9, wherein R^8 and R^9 are each independently lower alkyl, or R^8, R^9 and nitrogen atom to which they are attached form an optionally substituted, saturated or partially saturated N-containing heterocyclic group optionally having one or two lower alkyl(s);

R^7 is lower alkyl;

R^{10} is the same as R^6 defined above; and

q is 1 or 2,

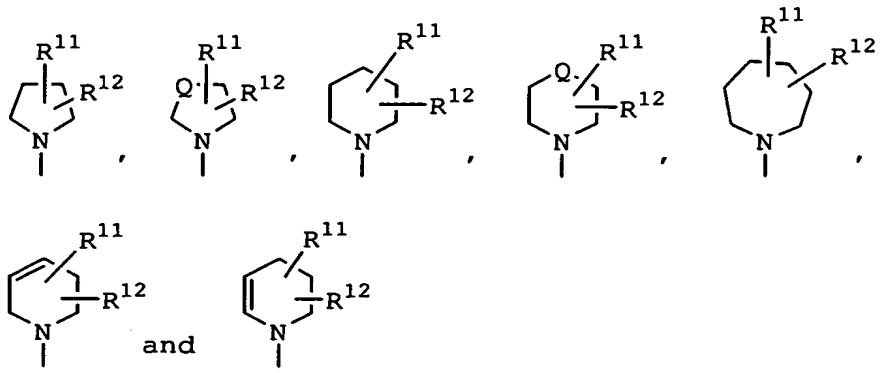
or a salt thereof.

2. The compound of claim 1, wherein

R^1 is hydrogen, lower alkyl, lower alkenyl, halo(lower)alkyl, cyclo(lower)alkyl, lower alkoxy, lower alkylthio, lower alkylsulfonyl or NR^3R^4,

wherein R^3 and R^4 are each independently hydrogen, lower alkyl, cyclo(lower)alkyl, lower alkanoyl; or

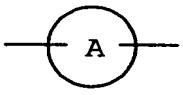
R^3, R^4 and nitrogen atom to which they are attached form an optionally substituted, saturated or partially saturated N-containing heterocyclic group selected from



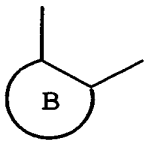
and

wherein R^{11} and R^{12} are each independently hydrogen or lower alkyl, and Q is $-N(R^{13})-$, $-O-$, $-S-$, $-SO-$ or $-SO_2-$, wherein R^{13} is hydrogen or lower alkyl;

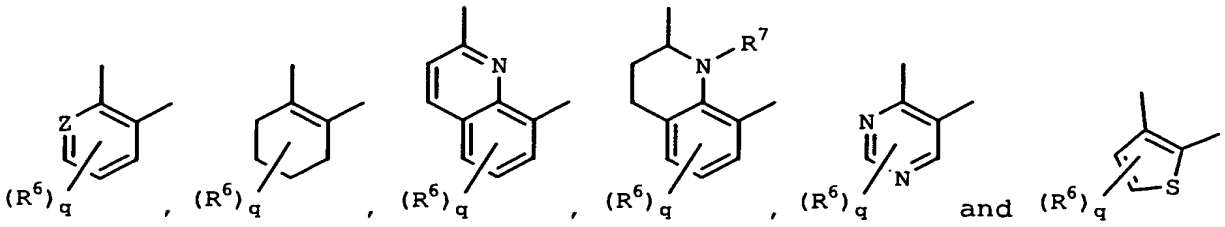
R^2 is hydrogen, phenyl, pyridinyl, pyrimidinyl, pyrazolyl, thiazolyl, pyrrolyl, triazolyl in which imino group is optionally protected by amino protective group, tetrazolyl, furanyl or thienyl, each of which is optionally substituted by cyano, optionally protected amino, lower alkyl or pyrrolyl substituted by one or more lower alkyl(s);



is phenylene, pyridinediyl, indolinediyl, isoindolynediyl, 3-oxo-2,3-dihydro-1H-indolediyl or 3,4-dihydro-2(1H)-isoquinolinediyl; and



is bivalent residue derived from arene or heteroarene selected from

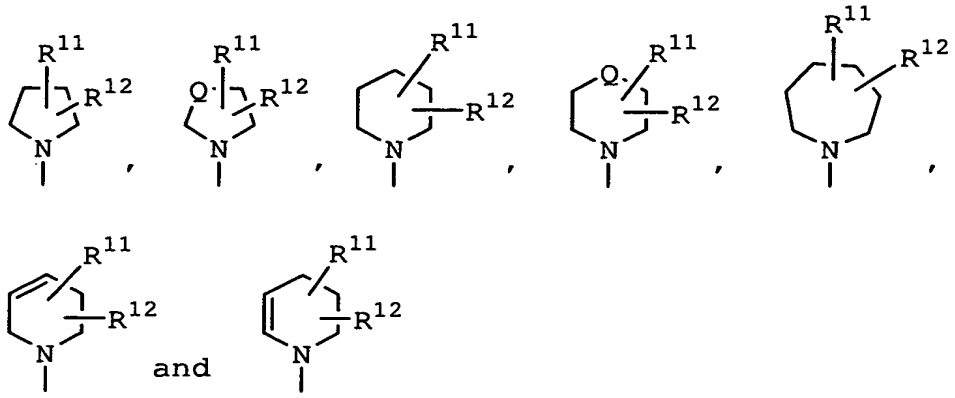


wherein

Z is N or $C(R^{10})$,

R^6 is hydrogen, halogen, lower alkyl, lower alkoxy, halo(lower)alkyl, lower alkanoyl, lower alkylthio or -NR^8R^9, wherein R^8 and R^9 are each independently lower alkyl, or

R^8, R^9 and nitrogen atom to which they are attached form an optionally substituted, saturated or partially saturated N-containing heterocyclic group selected from



and

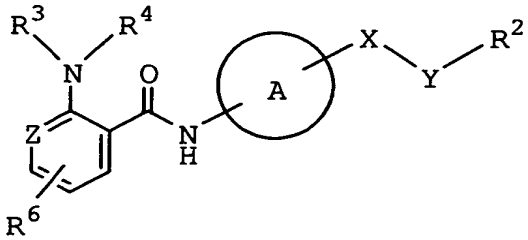
wherein R^{11}, R^{12} and Q are as defined above;

R^7 is as defined above; and

q is 1 or 2,

or a salt thereof.

3. A compound of the formula (I')



(I')

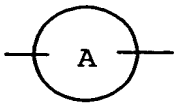
wherein

R^2 is aryl or heteroaryl, each of which is optionally substituted by cyano, optionally protected amino, lower alkyl or heteroaryl substituted by one or more lower alkyl(s);

R^3 and R^4 are each independently lower alkyl, or R^3, R^4 and

nitrogen atom to which they are attached form an optionally substituted, saturated or partially saturated N-containing heterocyclic group;

R^6 is hydrogen, halogen, lower alkyl, lower alkoxy, halo(lower)alkyl, lower alkanoyl or $-NR^8R^9$ (wherein R^8 and R^9 are each independently lower alkyl, or R^8, R^9 and nitrogen atom to which they are attached form an optionally substituted, saturated or partially saturated N-containing heterocyclic group);



is bivalent residue derived from arene or heteroarene;

X is direct bond or bivalent residue derived from piperazine,

Y is $-(A^1)_n-(A^2)_m-$

wherein A^1 is $-O-$, $-NH-$, $-N(R^5)-$, $-CO-$, $-CH(OH)-$, $-NH-CO-$, $-CH_2-NH-CO-$ or $-CH_2-CO-NH-$, wherein R^5 is amino protective group,

A^2 is lower alkylene, and

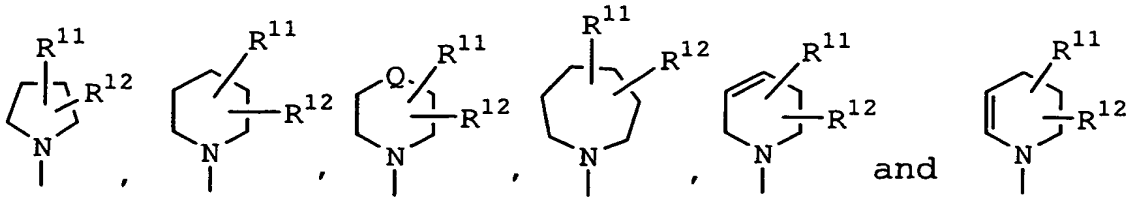
n and m are independently 0 or 1;

Z is N or $C(R^{10})$ (wherein R^{10} is the same as R^6 defined above), or a salt thereof.

4. The compound of claim 3, wherein

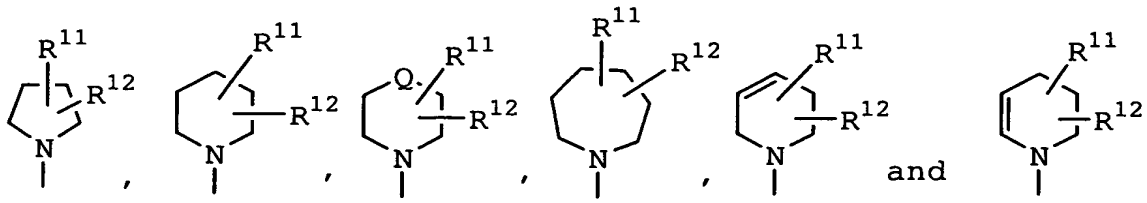
R^2 is phenyl, pyridinyl, pyrimidinyl, pyrazolyl, thiazolyl, pyrrolyl, triazolyl or tetrazolyl, each of which is optionally substituted by cyano, optionally protected amino, lower alkyl or pyrrolyl substituted by one or more lower alkyl(s),

R^3 and R^4 are each independently lower alkyl, or R^3, R^4 and nitrogen atom to which they are attached form a saturated or partially saturated N-containing heterocyclic group selected from

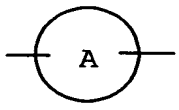


wherein R^{11} and R^{12} are each independently hydrogen or lower alkyl, and Q is $-N(R^{13})-$, $-O-$, $-S-$, $-SO-$ or $-SO_2-$ wherein R^{13} is hydrogen or lower alkyl;

R^6 is hydrogen, halogen, lower alkyl, lower alkoxy, halo(lower)alkyl, lower alkanoyl or $-NR^8R^9$ (wherein R^8 and R^9 are each independently lower alkyl, or R^{11}, R^{12} and nitrogen atom to which they are attached form a saturated or partially saturated N-containing heterocyclic group selected from



wherein R^{11}, R^{12} and Q are as defined above); and



is phenylene, pyridinediyl, indolinediyl or isoindolinediyl,

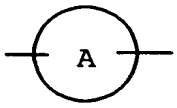
or a salt thereof.

5. The compound of claim 3, wherein

R^2 is phenyl, pyridinyl, pyrimidinyl, pyrazolyl, thiazolyl, pyrrolyl, triazolyl or tetrazolyl, each of which is optionally substituted by cyano, optionally protected amino, lower alkyl or pyrrolyl substituted by one or more lower alkyl(s);

R^3 and R^4 are each independently lower alkyl;

R^6 is hydrogen, halogen, lower alkyl, lower alkoxy, lower alkanoyl or halo(lower)alkyl; and



is phenylene,

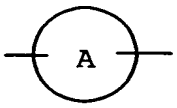
or a salt thereof.

6. The compound of claim 3, wherein

R^2 is phenyl, pyridinyl, pyrimidinyl, pyrazolyl, thiazolyl, pyrrolyl, triazolyl or tetrazolyl, each of which is optionally substituted by cyano, optionally protected amino, lower alkyl or pyrrolyl substituted by one or more lower alkyl(s);

R^3 and R^4 are each independently lower alkyl;

R^6 is hydrogen, halogen, lower alkyl, lower alkoxy, lower alkanoyl or halo(lower)alkyl; and



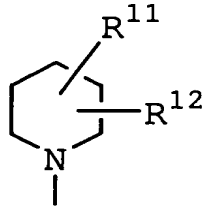
is indolinediyl or isoindolinediyl,

or a salt thereof.

7. The compound of claim 3, wherein

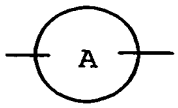
R^2 is phenyl, pyridinyl, pyrimidinyl, pyrazolyl, thiazolyl, pyrrolyl, triazolyl or tetrazolyl, each of which is optionally substituted by cyano, optionally protected amino, lower alkyl or pyrrolyl substituted by one or more lower alkyl(s);

R^3, R^4 and nitrogen atom to which they are attached form a saturated N-containing heterocyclic group of the formula



wherein R^{11} and R^{12} are each independently hydrogen or lower alkyl;

R^6 is hydrogen, halogen, lower alkyl, lower alkoxy, lower alkanoyl or halo(lower)alkyl; and



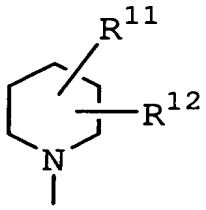
is phenylene,

or a salt thereof.

8. The compound of claim 3, wherein

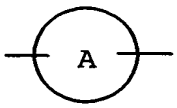
R^2 is phenyl, pyridinyl, pyrimidinyl, pyrazolyl, thiazolyl, pyrrolyl, triazolyl or tetrazolyl, each of which is optionally substituted by cyano, optionally protected amino, lower alkyl or pyrrolyl substituted by one or more lower alkyl(s);

R^3, R^4 and nitrogen atom to which they are attached form a saturated N-containing heterocyclic group of the formula



wherein R^{11} and R^{12} are each independently hydrogen or lower alkyl;

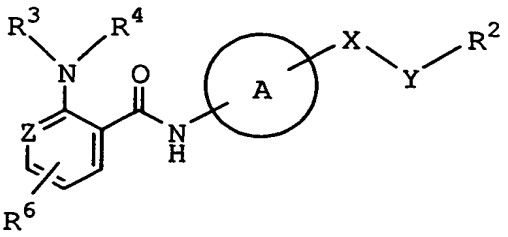
R^6 is hydrogen, halogen, lower alkyl, lower alkoxy, lower alkanoyl or halo(lower)alkyl; and



is indolinediyl or isoindolinediyl,

or a salt thereof.

9. A compound of the formula (I'')



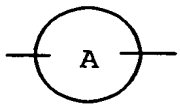
(I'')

wherein

R^2 is aryl or heteroaryl, each of which is optionally substituted by cyano, amino, lower alkyl or heteroaryl substituted by one or more lower alkyl(s);

R^3 and R^4 are each independently lower alkyl, or R^3, R^4 and nitrogen atom to which they are attached form an optionally substituted, saturated or partially saturated N-containing heterocyclic group;

R^6 is hydrogen, halogen, lower alkyl, lower alkoxy, halo(lower)alkyl or $-NR^8R^9$ (wherein R^8 and R^9 are each independently lower alkyl, or R^8, R^9 and nitrogen atom to which they are attached form an optionally substituted, saturated or partially saturated N-containing heterocyclic group);



is bivalent residue derived from arene or heteroarene;

X is direct bond or bivalent residue derived from piperazine,

Y is $-(A^1)_n-(A^2)_m-$

wherein A^1 is -O-, -NH-, $-N(R^5)-$, -CO- or -NH-CO-,

wherein R^5 is amino protective group,

A^2 is lower alkylene, and

n and m are independently 0 or 1; and

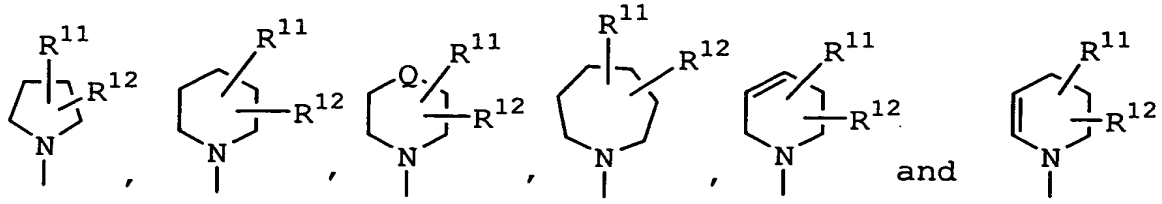
Z is N or $C(R^{10})$ (wherein R^{10} is the same as R^6 defined above), or a salt thereof.

10. The compound of claim 9, wherein

R^2 is phenyl, pyridinyl, pyrimidinyl or thiazolyl, each of which is optionally substituted with cyano, amino, lower alkyl or pyrrolyl substituted with one or more

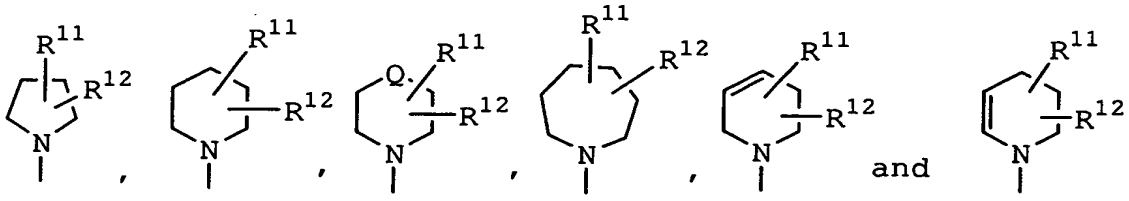
lower alkyl;

R^3 and R^4 are each independently lower alkyl, or R^3, R^4 and nitrogen atom to which they are attached form a saturated or partially saturated N-containing heterocyclic group selected from

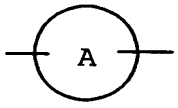


wherein R^{11} and R^{12} are each independently hydrogen or lower alkyl, and Q is $-N(R^{13})-$, $-O-$, $-S-$, $-SO-$ or $-SO_2-$ wherein R^{13} is hydrogen or lower alkyl;

R^6 is hydrogen, halogen, lower alkyl, lower alkoxy, halo(lower)alkyl or $-NR^8R^9$ (wherein R^8 and R^9 are each independently lower alkyl, or R^8, R^9 and nitrogen atom to which they are attached form a saturated or partially saturated N-containing heterocyclic group selected from



wherein R^{11}, R^{12} and Q are as defined above); and



is phenylene, pyridinediyl or indolinediyl,

or a salt thereof.

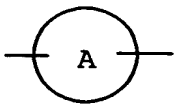
11. The compound of claim 9, wherein

R^2 is phenyl, pyridinyl, pyrimidinyl or thiazolyl, each of which is optionally substituted with cyano, amino, lower alkyl or pyrrolyl substituted with one or more

lower alkyl;

R^3 and R^4 are each independently lower alkyl;

R^6 is hydrogen, halogen, lower alkyl, lower alkoxy or halo(lower)alkyl; and



is phenylene,

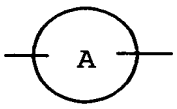
or a salt thereof.

12. The compound of claim 9, wherein

R^2 is phenyl, pyridinyl, pyrimidinyl or thiazolyl, each of which is optionally substituted with cyano, amino, lower alkyl or pyrrolyl substituted with one or more lower alkyl;

R^3 and R^4 are each independently lower alkyl;

R^6 is hydrogen, halogen, lower alkyl, lower alkoxy or halo(lower)alkyl; and



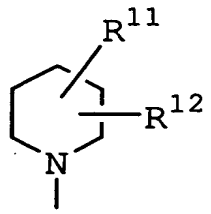
is indolinediyl,

or a salt thereof.

13. The compound of claim 9, wherein

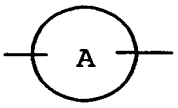
R^2 is phenyl, pyridinyl, pyrimidinyl or thiazolyl, each of which is optionally substituted with cyano, amino, lower alkyl or pyrrolyl substituted with one or more lower alkyl;

R^3, R^4 and nitrogen atom to which they are attached form a saturated N-containing heterocyclic group of the formula



wherein R^{11} and R^{12} are each independently hydrogen or lower alkyl;

R^6 is hydrogen, halogen, lower alkyl, lower alkoxy or halo(lower)alkyl; and



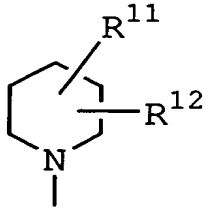
is phenylene,

or a salt thereof.

14. The compound of claim 9, wherein

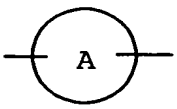
R^2 is phenyl, pyridinyl, pyrimidinyl or thiazolyl, each of which is optionally substituted with cyano, amino, lower alkyl or pyrrolyl substituted with one or more lower alkyl;

R^3, R^4 and nitrogen atom to which they are attached form a saturated N-containing heterocyclic group of the formula



wherein R^{11} and R^{12} are each independently hydrogen or lower alkyl;

R^6 is hydrogen, halogen, lower alkyl, lower alkoxy or halo(lower)alkyl; and



is indolinediyl,

or a salt thereof.

15. The compound of claim 1 or a pharmaceutically acceptable salt thereof for use as a medicament.

16. A pharmaceutical composition comprising a compound of claim 1 or a pharmaceutically acceptable salt thereof in admixture with a pharmaceutically acceptable carrier.

17. A method for inhibiting or decreasing Apo B secretion in a mammal, which comprises administering an Apo B secretion inhibiting or decreasing amount of a compound of claim 1 or a pharmaceutically acceptable salt thereof to the mammal.

18. A method for preventing or treating a disease or condition resulting from elevated circulating levels of Apo B in a mammal, which comprises administering an effective amount of a compound of claim 1 or a pharmaceutically acceptable salt thereof to the mammal.

19. The method of claim 18, wherein the disease or condition resulting from the elevated circulating levels of Apo B is selected from the group consisting of hyperlipemia, hyperlipidemia, hyperlipoproteinemia, hypoalphalipoproteinemia, hypercholesterolemia, hypertriglyceridemia, atherosclerosis, pancreatitis, non-insulin dependent diabetes mellitus (NIDDM), obesity, coronary heart diseases, myocardial infarction, stroke, restenosis and Syndrome X.

20. The compound of claim 3 or a pharmaceutically acceptable salt thereof for use as a medicament.

21. A pharmaceutical composition comprising a compound of claim 3 or a pharmaceutically acceptable salt thereof in admixture with a pharmaceutically acceptable carrier.

22. A method for inhibiting or decreasing Apo B secretion in a mammal, which comprises administering an Apo B secretion inhibiting or decreasing amount of a compound of claim 3 or a pharmaceutically acceptable salt thereof to the mammal.

23. A method for preventing or treating a disease or condition resulting from elevated circulating levels of Apo B in a mammal, which comprises administering an effective amount of a compound of claim 3 or a pharmaceutically acceptable salt thereof to the mammal.

24. The method of claim 23, wherein the disease or condition resulting from the elevated circulating levels of Apo B is selected from the group consisting of hyperlipemia, hyperlipidemia, hyperlipoproteinemia, hypoalphalipoproteinemia, hypercholesterolemia, hypertriglyceridemia, atherosclerosis, pancreatitis, non-insulin dependent diabetes mellitus (NIDDM), obesity, coronary heart diseases, myocardial infarction, stroke, restenosis and Syndrome X.

25. The compound of claim 9 or a pharmaceutically acceptable salt thereof for use as a medicament.

26. A pharmaceutical composition comprising a compound of claim 9 or a pharmaceutically acceptable salt thereof in admixture with a pharmaceutically acceptable carrier.

27. A method for inhibiting or decreasing Apo B secretion in a mammal, which comprises administering an Apo B secretion inhibiting or decreasing amount of a compound of claim 9 or a pharmaceutically acceptable salt thereof to the mammal.

28. A method for preventing or treating a disease or condition resulting from elevated circulating levels of Apo B in a mammal, which comprises administering an effective amount of a compound of claim 9 or a pharmaceutically acceptable salt

thereof to the mammal.

29. The method of claim 28, wherein the disease or condition resulting from the elevated circulating levels of Apo B is selected from the group consisting of hyperlipemia, hyperlipidemia, hyperlipoproteinemia, hypoalphalipoproteinemia, hypercholesterolemia, hypertriglyceridemia, atherosclerosis, pancreatitis, non-insulin dependent diabetes mellitus (NIDDM), obesity, coronary heart diseases, myocardial infarction, stroke, restenosis and Syndrome X.